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ABSTRACT

To explicate the factors behind standards implementation, the results of a project to develop and pilot test a process that bridges the gap between setting standards and improving student achievement is presented. The text focuses on the Implementing Academic Standards (IAS) program, which was designed to develop and pilot-test a process for implementing Minnesota's high standards for student learning. The paper opens with an overview of theory and research on standards-based reforms, focusing on types of standards, definitions of standards-based reform, and reform implementation. To illustrate how the process works, background information on Minnesota's standards movement is provided. The bulk of the text is devoted to the implementation and the effects of IAS. Details on research questions, data-collection methods, and findings are presented. A summary of the results of the study and implications for further efforts to implement standards-based reform are given. Areas where further research is needed to increase understanding of the change theory behind standards-based reform are likewise identified. (RJM)

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# Taking Standards Beyond the Classroom Door: A Process for Implementation

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Standards are the predominant theme in current thinking about educational reform. Numerous groups, from discipline-based organizations to state department of education to individual school and school districts have developed standards. Yet, standards by themselves will not increase student achievement. Schools need to undergo a complex series of changes before standards can have an impact on student learning. This process includes not only modifications of curricula, but also giving teachers the time and resources to incorporate the standards into their instructional practice and beliefs.

This paper presents the results of a project to develop and pilot test a process to bridge the gap between setting standards and improving student achievement. The study has implications for any group trying to improve student achievement through standards-based reform. If educational resources are not to be wasted, we need to increase our knowledge of how to integrate standards into daily classroom practice.

## Theory and Research on Standards-Based Reforms

Standards are one type of the many reform initiatives that have surfaced since the publication of *A Nation at Risk* in 1983. A recent report published by the American Federation of Teachers (Gandolf, 1995) stated that 49 states are involved in standards-based reform and 31 have statewide testing programs linked to these standards, or plan to develop these tests. The voluntary national tests proposed by the Clinton administration are an example of a federal attempt to set standards for what students should know and do.

### Types of Standards

Given the plethora of standards in education today, we need to be clear about which type of standards we are referring to when discussing standards-based reforms. The project described in this paper focused on implementing standards for student learning. Although other types of standards such as teaching or schooling may be components of some standards-based reforms, they are not the focus of this paper.

Standards for student learning are generally broken into three types: content standards, performance standards, and opportunity to learn standards. Ravitch (1995) distinguished each type as follows:

- content (or curriculum) standards define what teachers are supposed to teach and students are expected to learn.
- performance standards define degrees of mastery or levels of attainment.
- opportunity to learn standards define the availability of programs, staff, and other resources that schools, districts, and states provide so that students are able to meet challenging content and performance standards.

## Defining Standards-Based Reform

In addition to a plurality in types of standards, there are also differing views of how to define standards-based reform and standards-based education. Attempting to make sense of the variety of reform initiatives present in education today, Conley (1997) has identified twelve dimensions of restructuring. Reforms based on standards are directed at what Conley has labeled the central variables of restructuring: learning standards, curriculum, instruction, and assessment. In contrast to other reforms such as site-based management or the use of technology, standards-based reforms directly target the areas that are the ultimate target of any reform. Conley also notes that change in the central variables is most difficult to achieve and "when developing 'restructuring' strategies, most educators appear to prefer to look first at change in almost anything other than these variables" (p. 114).

In 1995, the National Academy of Education Panel on Standards-Based Education Reform included the following components in their definition of standards-based reform:

> Setting standards of performance in academic subject areas as a means of improving the substance of school curricula and increasing the motivation and effort of students, teachers, and school systems and thereby improving student achievement. The reform assumes high standards for all students and has two components: challenging standards that set out what students should know and be able to do, and an accompanying agenda for educational equity (p. 70).

A different view is offered by Massell, D., Kirst, M., and Hoppe, M. (1997) based on their study of standards-based reforms in nine states. They report that in addition to setting standards and developing assessments, many states link other reform initiatives to standards. Examples of these additional reforms are as follows: site-based decision making, open enrollment, teacher certification, and accountability systems. To encompass the broad focus of these reforms they use the term "standards-based systemic reform" and define it as follows:

- Establishing challenging academic standard for what all students should know and be able to do;
- Aligning policies – such as testing, teacher certification, and professional development-and accountability programs to standards; and
- Restructuring the governance system to delegate overtly to schools and districts the responsibility for developing specific instructional approaches that meet the broadly worded standards for which the state holds them accountable. . . the overarching objectives of this policy approach are to foster student mastery of more rigorous, challenging academic content and to increase the emphasis on its application" (pp. 1-2).

In addition to defining standards-based reforms, researchers have also attempted to define what standards-based education would look like in practice. According to Conley (1997), standards-based education generally differs from traditional education because instead of receiving credit for the amount of time spent receiving instruction, a student must achieve the performance level specified in the standard. In other words, student are promoted to the next grade based on achievement of performance standards rather than on the number of courses taken. He also emphasizes that in a standards-based system, the learning standards, the method of assessing student performance, and the required level of performance needed for passing are generally set externally rather than by individual teachers as they are in a traditional system.

Harris and Carr (1996) defined a set of criteria for schools to use in assessing their progress towards a standards-based curriculum. These criteria cover five areas: standards, development and selection of activities and resources, products and performances, criteria, and scoring guides. They describe the most accomplished level of implementation as follows:

- Standards form the basis of overall consideration of the curriculum, instruction, and assessment within and beyond the classroom.
- Activities and resources are developed as part of a long-range plan to ensure student attainment of standards over time.
- Products and performances are planed to provide a cumulative record of evidence of students' attainment of standards over time.
- Criteria address separate standards and define overall performance across standards.
- Scoring guides are anchored in exemplars of student work with benchmarks at each level (p. 55).

They also note that when teachers are using a standards-based curriculum their communication with students, parents, and the community is based on student progress towards the standards.

As noted by Massell, Kirst, and Hoppe (1997), another reform strategy often used in conjunction with standards is that of accountability. Although it is possible to have standards in place without a corresponding system for holding schools or students accountable for meeting them, it is not possible to have accountability without standards.

Newmann, King, and Rigdon (1997) define a complete school accountability system as having, at minimum, these four components:

1. Information about the organization's performance (e.g., test scores).

2. Standards for judging the quality or degree of success of organizational performance (e.g., a mean achievement score higher than other schools with comparable demographic characteristics).

3. Significant consequences to the organization (i.e., rewards and sanctions such as bonuses to teachers in the school) for its success or failure in meeting specified standards.

4. An agent or constituency that receives information on organizational performance, judges the extent to which standards have been met, and distributes rewards and sanction (e.g., the state department of instruction) (p. 43).

McLaughlin, Shepard, and O'Day (1995) make an important distinction between using performance standards for accountability versus using them for certification. The latter refers to situations where results are reported for individual students and thus used to certify their achievement. In some instances, the assessment results are only reported on aggregated levels and are thus used to hold parts of the education system accountable. Darling-Hammond and Falk (1997) make the important point that "ultimately, accountability is not only about measuring student learning but also about actually improving it" (p. 193).

Why should standards and accountability systems improve student learning? How should setting standards lead to increases in student achievement? The next section summarizes various perspectives on the theory of change in standards-based reform and then discusses what is known about the impact of standards-based reform on teaching and learning.

## Implementing Standards-Based Reforms

Research and writing on standards-based reform tends to focus on the content of standards or who should set standards. Little is known about how to move from setting standards to actually using them to change instruction and improve student achievement. The assumption behind standards-based policies is that if an external agent defines standards and mandates assessments for these standards, then the whole education system will change in whatever ways are needed to help students achieve the standards. As stated by McLaughlin, Shepard, and O'Day (1995) "standards-based reform developed out of the common sense notion that student effort and level of achievement are directly affected by the expectations that have been set. It is assumed that by holding schools and students accountable for meeting performance standards, they will be motivated to undertake major changes" (p. xv).

Two researchers have begun to explore the details of implementation and based on previous research with earlier reforms, several theorists have described their own ideas of how to

successfully implement standards-based reform. These perspectives will be reviewed in this section.

Based on a long-term study of standards-based reform in nine states, Massell (1997) has noted that states use a range of strategies to bridge the gap between state standards and classroom practice via curriculum. She described this range as "from efforts to leverage change in the commercial publishing industry, sponsorship of curriculum development, or sponsorship of curriculum development as part of professional development, evaluation and dissemination about existing curricula . . ." (p. 4).

In another report based on the same study of standards-based reform in nine states, Massell, Kirst, and Hoppe (1997) observed the following issues related to implementation:

- Local educators find standards beneficial because they provide focus for instruction but they are stated too broadly.
- Teachers develop assessments or standards in some states, which provides professional development.
- The implicit or explicit assumption in policies that "district or school staff would have the capacity, resources, time and expertise to flesh them out [standards] into a local curriculum" (p. 23) places a huge burden on local educators.
- Teachers need direction and support from the district. "Policymakers in recent years have ignored the role of the district administrators and local boards, frequently conceiving of them as impediments to be bypassed rather than partners in the change effort. Yet these administrators are often pivotal conduits for reform interpreting its substantive and providing— or not providing, as the case may be— both organizational structures and resources that effect whether and how they are translated into school and classroom practices" (p. 63).

In a recent study, Newmann, King, and Rigdon (1997) conclude that external accountability mechanisms alone are not sufficient to improve school performance. Based on data gathered from twenty-four restructuring schools, they propose that three factors influence the likelihood that external standards will lead to increases in student achievement.

The first factor is organizational capacity, which Newmann et al. (1997) define as, "the degree to which the human, technical, and social resources of an organization are organized into an effective *collective* enterprise" (p. 47). In a school with a high organizational capacity, all resources are directed toward a clear, shared purpose for student learning. Teacher knowledge, leadership and a school's technical and financial resources are effectively integrated to accomplish the school's vision for student achievement.

The second factor is internal accountability. Schools with internal accountability do not rely on an external agent to prescribe standards and provide incentives and sanctions. Instead, staff within the school exerts peer pressure to meet internal standards for performance and the school has a process for collecting information to monitor progress on these standards.

The third factor is the difficulty created by controversies over how to implement standards. These include conflicting views on what the content of standards should be and who should establish the standards. To overcome the difficulties created by these controversies, Newmann et al. (1997) propose that policies designed to increase school's external accountability should include efforts to increase the organizational capacity of schools and support schools to develop internal accountability.

Their examination of these factors in 24 schools led them to conclude the following:

- Even when a strong external accountability system is present, schools that do not have organizational capacity to address these challenges will not improve their performance.

- It is possible for a school to develop strong internal accountability even without external mandates.

- Highly prescriptive standards linked to high-states consequences through a mandate by external authorities "can deny school staff both the 'ownership' or commitment and the authority it needs to work collaboratively to achieve a clear purpose for student learning" (p. 62).

A different perspective on standards implementation comes from Darling-Hammond (1994). She believes that implementation should begin by building the capacity of teachers and schools, rather than starting with content and performance standards. With their increased level of knowledge, teachers and schools will be better prepared to implement this major change. The role of state and federal governments in this model would be "to create the policies that ensure that teachers and schools have the knowledge, the material resources, and the support for school-based equity that will allow them to create good curriculum for the students they serve" (p. 482).

There are two major, somewhat related reasons for Darling-Hammond's (1994) emphasis on building capacity as a first step in standards implementation. First, because she believes students have varying routes to learning and content and performance standards that are determined "on-top" can not accommodate this diversity. Instead, teachers need the knowledge of how to adapt instruction to help every student achieve their potential. If they are just handed a set of standards they are unlikely to develop the skills to make these crucial instructional modifications. "To be effective, teachers must meet students where they are, not where an idealized curriculum imagines they should be" (p. 491). Her second reason comes from research on educational change generally. She refers to the research of Fullan (1994) and stresses the importance of teacher understanding of a reform to the potential success of the reform. By having teachers develop standards and assessments locally, they are provided with the opportunity to work through the standards. This process, she states,

"is in itself educative and supportive of change as it stimulates inquiry into local practices in relation to new standards that have engaged local ownership" (p. 488).

Another component of standards-based education that Darling-Hammond (1994) emphasizes is the importance of providing teachers with information they can use to adapt their instruction to individual student needs. If the performance standards are used only to sort and select students into more and less learning opportunities, she believes there is little chance that standards will improve student achievement as intended.

## Background on Minnesota's Standards Movement

The current policy environment in Minnesota provides a good context for further study on the implementation of standards-based reform. The basic standards and high standards are externally imposed by the state department of education (hereafter MDE). Currently, the state rule requires students to achieve passing scores on state-developed basic skill tests in reading, mathematics, and writing in order to graduate from high school. The assessment packages for the high standards, however, provide school districts with much more flexibility. Because state law forbids a mandated state curriculum, each district can modify the assessment packages to fit their local context and the state does not specify how to instruct the students. In order to prepare students to meet the state standards, it appears that districts must already have, or must develop, the organizational capacity defined by Newmann, King, and Rigdon (1997). As described earlier, one component of organizational capacity is the skills and knowledge teachers will need to effectively practice in the changed environment. The significant bottom-up component of Minnesota's reform approach also provides an opportunity to study effective means for building teacher capacity, the primary emphasis in the writing of Darling-Hammond.

Minnesota schools have been hearing about standards-based reform for seven years, however, it has yet to develop into a full accountability system as elaborated by Newmann et al. (1997). In May 1991 the Minnesota State Board of Education gave preliminary approval to a new system based on graduation standards and MDE began developing the standards and assessments for this new system. Instead of determining graduation based on the completion of the number of courses and credits, student would graduate only by demonstrating achievement of the student learning standards. Two years later, the Board selected thirteen pilot sites to continue the development work in conjunction with MDE. Each year the number of pilot sites has increased, and based on data gathered from the pilot sites and public reaction, the standards and assessments have continued to evolve.

The Minnesota K-12 Graduation Standards are made up of two separate pieces: basic standards in reading, mathematics, and writing composition; and high standards in ten learning areas such as inquiry and math applications. The high standards are interdisciplinary and not tied to specific subject areas or courses. Therefore, each district must decide which standards will be covered in which courses. This may result in variation across districts in how students prepare to achieve the standards.

The basic standards reflect minimum competencies in essential skills for graduates. They are assessed by state developed tests which are first administered to students in the eighth grade. The reading and math tests are multiple choice form and writing composition is assessed through a writing sample.

In contrast, the high standards define what it takes for students to know or do something very well. They are oriented toward excellence and proficiency rather than minimum competence. The content of the high standards was frequently revised during the seven-year development period but currently the standards are going through the rulemaking process and approval is expected this spring. The high standards are assessed by "performance packages" developed by MDE in conjunction with pilot sites. The packages are made up of performance tasks that require students to demonstrate their knowledge and skills in a real-world context. The high standards allow more flexibility at the local level because teachers can change the topic of a package and students can select from multiple standards within each area.

Minnesota law forbids a state curriculum, therefore the high standards have been written to provide latitude for local interpretation and curriculum. The standards focus on what a student should be able to know and do but do not include much content because this is to be determined locally. Assessment packages for the high standards were developed by pilot sites and curriculum is expected to be developed locally. This system exemplifies what is known as a "bottom-up and top-down approach." The state developed the standards and assessments, in collaboration with statewide educators and community members, but it is up to local districts to determine how to prepare students for the assessments. For example, one district may choose to teach students inquiry skills through a semester long science project and another district may choose to teach the same skills through a social studies course.

This system also requires development of teacher capacity because teachers are required to do things they have not done before. For example, the high standards require teachers to do the following: teach and assess different skills, which are embedded in the standards; develop instruction aligned to the standards; and modify instruction as needed to prepare each student for success on the assessments.

The 1996 freshman class will be the first to graduate under the new system of graduation standards; they are required to achieve basic requirements in reading and math. The writing composition requirement becomes effective for the 1997 freshman class. Due to its lengthy and controversial development process, the high standards component does not become effective until the freshman class of 1998, if the rule is approved at that time. Although school districts have not yet had to withhold diplomas from students not passing the basic skills tests by the end of the twelfth grade, district level scores are made public by the Department and many districts feel pressure from their constituencies to release results by school.

In 1997 a statewide testing and reporting system was established to assess student achievement of the standards. In addition to the state basic skills tests, students in the 3rd and 5th grade are now required to take the Minnesota Comprehensive Assessments to measure their progress towards the high standards. The legislature also required the

Commissioner to recommend legislation on performance funding options that would tie state education funding to school performance. The current education funding law expires in 1999. Also in the 1997 session the legislature authorized funding for an Office of Educational Accountability, an office to be housed in an institution of higher education to maintain its independence from the Department.

Looking back at the accountability system components delineated by Newmann, King, and Rigdon (1997), we can see that Minnesota currently lacks the minimum contents of an accountability system. Testing and publication of scores on the basic skills tests and comprehensive assessments is in place but only the basic skills tests have established standards for judging performance. The current school year is considered a baseline year for establishing standards on the comprehensive assessments. The department continues to work with schools to develop skills in assessing the high standards and reporting systems to track student results. The procedure for establishing standards for student performance on these assessments is unclear and may be done locally. Finally, only in the last legislative session did Minnesota establish an office to receive and judge results and a study of performance funding options is underway.

## Implementing Minnesota's High Standards for Student Learning

The focus of this paper is a project designed to develop and pilot-test a process for implementing Minnesota's high standards for student learning. The project, Implementing Academic Standards (hereafter called IAS), was funded by a 2 million dollar grant MDE. It was a collaborative endeavor among seven diverse Minnesota school districts and a for-profit software developer, which will be called NEI in this paper. The project covered an 18-month period from March 1996-August 1997.

As described above, MDE had already developed the high standards for student learning and corresponding performance assessment packages for most of these standards. IAS believed the next step in implementing the high standards was to have teachers develop learning activities linked to the standards. Because the high standards were relatively new and are unique to Minnesota, there were no curriculum packages or textbooks that districts could purchase to guide instruction. At this point in Minnesota's standards implementation process, no one had yet tried to develop classroom activities linked to the standards. IAS strongly believed that unless a process was developed to help teachers incorporate the standards into their daily classroom practice, then the standards would not be effective in changing instruction and improving student achievement.

By choosing to create a process for teachers to develop standards-based instructional activities, the project's approach to standards implementation resembles the strategy described by Massel, Kirst, and Hoppe (1997) as changing instruction through professional development[1]. The approach also addresses some of the components of Newmann, King, and Rigdon's (1997) organizational capacity by trying to increase teachers' skills and

[1] Minnesota is one of the states included in their study.

knowledge of how to use standards to guide instruction, thus enabling them to make decisions about curriculum, instruction, and assessment.

It is more difficult to describe this project in relation to the implementation model proposed by Darling-Hammond (1997). Although teachers in several districts worked with MDE to develop the high standards, the state is mandating that districts follow a common set of standards rather than allowing each district to develop standards within their local context. Unlike other top-down systems, however, the high standards and corresponding assessments were intentionally designed to provide a lot of flexibility for local adaptation. As yet, the state is not mandating that districts use any particular assessment packages [2]. Instead, each district must establish a plan for integrating the standards into their curriculum and must assess students on the high standards using either state-developed assessment packages or assessments they develop locally. This situation requires districts to do what Darling-Hammond (1994) describes as "working through .... [which is] in itself educative and supportive of change as it stimulates inquiry into local practices in relation to the new standards that have engaged local ownership. It also allows the construction of curriculum that is connected to students' experiences, cultures, and communities by building on prior knowledge and understandings in the course of reaching for new concepts and skills" (p. 488). By building teacher capacity to develop instruction linked to the standards, the project would, as Darling-Hammond (1993) advocates, "create bridges between the very different experiences of individual learners and the common curriculum goals. .... Teachers must diversify their practice so that they can engage each of their students in whatever ways are necessary to encourage learning" (p. 754).

Another goal of the project was to establish a network of teachers who were implementing the standards. They felt it was important to encourage collaborative work for several reasons. First, they believed it was unrealistic to expect each teacher to develop their own set of instructional activities for the standards. Second, they recognized that in a standards-based system a teacher may need multiple lessons for students who are not successful the first time (as described by Darling-Hammond above) adding further to the burden of writing instructional plans. By working together teachers could share ideas for what kinds of activities worked for what kind of students and benefit from each other's experiences. Finally, experience with other reforms and previous work on the state standards had shown many members of the project leadership the value of working collaboratively.

The project attempted to stimulate collaboration in several ways. First, the sites established a common template for writing and recording learning activities. The purpose of the template was to standardize the language used by teachers to describe their instruction and to ensure that sufficient information was recorded so that another teacher could use an activity developed by someone else. Second, the project provided each participant with e-mail access so they could collaborate electronically and did not have to meet in person. Third, the learning activity template was incorporated into a software package so activities developed by teachers could be stored in an electronic database, or library.

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[2] In current policy, the assessment packages can be developed locally or sites can use or modify packages developed by the State. The newer Minnesota Comprehensive Examinations, which were given for the first time at the 3rd and 5th grades and will ultimately also be given at the 11th grade, are mandated assessments of the high standards but current policy does not state that student diplomas will be withheld from students not reaching a certain score on the test.

The intention was to have both a library at each project site that would include activities developed by teachers in that district, and a much larger library of activities located on a website maintained by the software developer. This website, known as UnitHouse, would contain activities developed by teachers throughout the state. It was hoped that the electronic libraries would encourage teachers to deprivatize their practice and collaborate with each other by 1) publishing activities they had developed in the libraries, and 2) using the libraries to locate activities relevant to their practice and downloading to modify, or use as is, in their own classrooms.

## Research Questions and Methods

We were hired by IAS to document their development of a process for integrating Minnesota's high standards for student learning into classroom instruction, assess the effectiveness of this process, and identify effective practices for building teacher capacity to implement standards. Our study attempted to answer the following questions:

> What process did IAS develop for integrating Minnesota's high standards into classroom instruction? What did IAS learn about effective practice for integrating high standards into instruction?
>
> To what extent does the process IAS developed increase teacher capacity to implement Minnesota's high standards for student learning?
>
> To what extent did IAS develop a network of teachers who are working to implement Minnesota's high standards for student learning?
>
> To what extent did IAS increase the level of standards-based practice among teachers who participated in the project?

## Data Collection Methods

We used three data collection methods in our study: observations, interviews, and a survey. Each is described below.

### Observations

In order to document the process IAS developed for integrating Minnesota's high standards into classroom instruction and identify effective practices, we observed meetings of the project leadership team and teacher training sessions. The leadership team (hereafter LT) included a representative from each of the eight participating districts[3] and a representative from NEI, the software development company. A representative of one district also served as the project coordinator. Other district and NEI staff attended the meetings occasionally to provide input as needed.

[3] One large urban district had two representatives. Given the size of the district and its emphasis on site-based management, each school essentially represented a distinct pilot site for purposes of this project.

We attended all but one of the 20 LT meetings that were held throughout the project's implementation. We took notes during each meeting and these notes, along with official minutes of each meeting, were used in this study.

We also attended teacher-training sessions at five sites during the summer of 1996, and attended follow-up training that took place during the summer of 1997. During each session, we took notes and had informal conversations with the participants and trainers.

Interviews

In addition to observing project activities, we interviewed members of the LT and a sample of teachers. In September 1996 and September-October 1997, we interviewed each LT member. The interviews consisted of a series of open-ended questions. In the first round of interviews, the questions focused on their experiences with the initial training sessions for teachers. The second round of interviews addressed each stage of the project's implementation process. In addition, we contacted other people in some of the sites to gather more complete information about the implementation process at those sites.

After the project ended, we interviewed 10% of the teachers who had participated. The purpose of these interviews was to supplement the written survey of teachers (described below) by gathering in-depth information about how they developed instructional activities both before and during the project. We established the interview sample by asking the coordinator at each site to identify the teachers who had been most involved in the project. Because the level of participation by teachers varied considerably within and across sites, we intentionally decided to interview those who were most involved in order to have the best chance of getting information about how the project may have changed the way they develop instructional activities. Given the difficulty many sites experienced with making the software available to teachers during the project, we did not require that the teachers in the sample had had extensive experience using the software to write activities.

Written Survey

The written survey we used in this study is based in part on the professional community index described in Louis, Marks, and Kruse (1996). We selected items that corresponded with the shared commitment and collaborative activity component of Newmann, King, and Rigdon's (1997) organizational capacity and modified them to fit the context of this study. Because professional community is defined as a characteristic of the school as a whole, we had to adapt the definition a bit for our study. Ultimately, the hope of IAS is that all teachers in a school, district, and the state would be working to implement standards and working together in various combinations across schools, districts, and even states. However, in this initial exploratory study the community was defined as teachers that worked together to develop learning activities and when they were developing learning activities. We also excluded some items because they described behaviors that could not have occurred during the project such as " except for monitoring student teachers or substitute teachers, how often have you visited another teacher's classroom to observe and discuss their teaching since the beginning of the current school year?" (p. 789, Louis et al., 1996). We also couldn't ask about faculty meetings or lounge conversations because these items would involve teachers outside the project.

In addition to drawing items from the professional community index by Louis, Marks, and Kruse (1996), we also wrote new items to measure other study variables such as standards-based practices because, in a search of the literature, we did not find any instruments were sufficient. We used the criteria for a standards-based curriculum developed by Harris and Carr (1996) to develop the items on standards-based knowledge, beliefs, and practices.

Members of the LT reviewed the first draft of the survey and made suggestions for content changes and item wording. After making the suggested revisions, we pilot-tested the next survey draft with teachers in almost all of the sites. They provided further useful suggestions about wording of items and response options.

We sent the final version of the survey to the coordinators at each site and they distributed them to the teachers whom had participated. The surveys included a stamped return envelope addressed to us to assure confidentiality. The first mailing generated a response rate of 27% so we sent out additional surveys to the coordinators and extended the return deadline. Coordinators were provided with a list of people who had not completed the survey and we asked them to distribute the survey to these people.

Data Analysis

We collected a large amount of qualitative information during the project and we used the following techniques condense it:

- We reviewed responses to each interview question and clustered similar responses.
- We reviewed our field notes and the official meeting minutes to identify major events and themes.

Qualitative data collection and analysis procedures are vulnerable to researcher bias because, despite our efforts to bracket our biases, we may unintentionally have overlooked or minimized the significance of certain events or comments. We used several strategies to minimize the potential bias. First, we conducted interviews and observed meetings as a team whenever possible to provide us with two perspectives. Second, we asked two colleagues not involved in the study to review this report. Finally, the project coordinator and NEI staff members reviewed the report in order to identify factual errors or areas where alternative interpretations exist.[4]

The survey responses were entered into a database and analyzed using SPSS software.

[4] The other members of the LT were also given the opportunity to review the report but none of them participated.

## Results

This section summarizes results of the study and is organized by the research questions. First, however, we'll review the response rates for the survey and the interviews.

### Response Rates

One site dropped out of the project in the last quarter and chose not to participate in the survey or teacher interviews. The 26 teachers from this site are not included in further totals. Interviews were completed with each member of the LT and in some sites we contacted additional administrative staff to gather more complete information.

We attempted interviews with 26 teachers. We completed 20 interviews (77%); the remaining teachers either chose not to participate or did not return phone calls (at least four messages were left). The percent of teachers completing the interview was fairly constant across sites with the exception of site G where only two of the four teachers agreed to an interview (see Table 1).

Table 1: Interview Completion by Site

| Site | Number of teachers in project | Number completed/Number attempted |
|---|---|---|
| A | 36 | 3/4 |
| B | 30 | 2/3 |
| C | 42 | 4/4 |
| D | 19 | 2/2 |
| E | 14 | 2/2 |
| F | 48 | 6/7[a] |
| G | 42 | 2/4 |
| Total | 231 | 20/26 |

[a]The number of interviews attempted for this site was based on the total number of participants (n=67) including the 19 that were not included in the written survey because they dropped out of the project after the first training series.

We mailed surveys to 231 teachers. This total does not include the 26 teachers from the site that dropped out of the project; also excluded were 19 teachers at one site who dropped out of the project after the first training series. Ninety-one of the teachers completed the survey for a response rate of 39%. As shown in the table below, two sites had 10% or fewer of their participating teachers complete the survey (one of these also had the lowest response to the interview). Given these low response rates, we can not know whether the results in this report are representative of the teachers at these two sites.

Over half of the respondents (56%) teach in an elementary setting. The number of years respondents have been teaching varies from 2 years to 30 years; 54% had been teaching ten years or less.

Currently, we are attempting to contact a random sample of non-respondents by telephone to determine if they are different on key variables than those who returned the survey through the mail. This effort will provide more information about the risk in generalizing from the respondents to the written survey to all IAS participants.

Table 2: Survey Completion by Site

| Site | Number of teachers in project | Number /Percent of Surveys Completed |
|---|---|---|
| A | 36 | 0 0% |
| B | 30 | 14 47% |
| C | 42 | 23 55% |
| D | 19 | 15 79% |
| E | 14 | 6 43% |
| F | 48 | 29 60% |
| G | 42 | 4 10% |
| Total | 231 | 91 39% |

## A Process for Developing Standards-Based Instruction

One objective of IAS was to develop a process teachers could use to integrate Minnesota's high standards into their classroom instruction. As will be described below, the LT needed to make significant changes in their plans during this stage of the project. Although these changes meant that the project got behind schedule and took up much more time on the part of everyone involved, a majority of the participants would agree that this stage of the project was the most productive.

Initially, the LT assumed that after providing teachers with training on how to use the software (into which the IAS template for writing learning activities had been incorporated) the teachers would be able to work on their own, or in teams, to develop instructional activities. Thus, the primary focus of the training was on how to use computers and how to use the software. Some of the sites also included an overview of the standards in their training, but all sites seemed to assume that once teachers became familiar with the software then they would be able to develop standards-linked instructional activities. Many of the sites had difficulties maintaining their computer networks, which contained the software, during the training due to an insufficient level of technical support within their districts. These disruptions to the software caused many teachers to become frustrated in their attempts to learn how to use the software.

As teachers began to develop learning activities during the first summer of the project, they encountered substantial obstacles, in addition to problems accessing the software. Some of the issues they experienced were as follows: areas of the standards were ambiguous or contradictory; the distinction between an instructional activity and an performance assessment was unclear; they were unsure how the instructional activities they were developing should fit in with existing district curricula and scope and sequence for instruction. To work with the project in clarifying these issues, the software developer hired a specialist in curriculum and assessment who had worked for the state department of education during an earlier phase of the standards initiative.

One change that resulted from this work was to establish a clear distinction between a learning activity and an assessment. The specialist and the project leadership agreed that in a performance task, evaluation is the major purpose of the assignment. In contrast, the major purpose of a learning activity is instruction and practice. To provide students with information and time to practice their skills in a non-judgmental manner, a checklist of performance criteria in a learning activity should only be used to provide feedback to the student and not for grading purposes.

The specialist also recognized that teachers were writing learning activities that looked like miniature versions of the assessment package for the intended standard. She worked with the teachers to identify what students needed to learn and how to break this down into multiple activities.

The most significant change in the project occurred in response to teachers' questions about how the activities they were developing fit with district curricula and other activities the teachers were already using. The project's model for implementing the standards, as it was originally conceived, started with the teachers. It was believed that teachers needed training to shift their thinking about instruction to a results rather than activities orientation. The assumption was that as teachers wrote learning activities linked to specific standards this shift would occur.

As described earlier, individual differences and district autonomy have always existed in Minnesota's education system and the standards are designed to preserve this autonomy by allowing for a great deal of flexibility based on local contexts. In a traditional education system, local curriculum design is heavily influenced by textbook selection; under the new model, desired results drive curriculum design. Based on their early experiences in having teachers write standards-based activities as special units outside the district curriculum, the LT recognized that teachers could not develop learning activities in isolation. Teachers needed to know which results, i.e., which parts of the standards, were their responsibility and which would be addressed elsewhere in the curriculum. Thus, district level leadership was needed up front to make decisions about how to interpret and place the standards in the overall district curriculum.

To assist districts in placing the standards in their overall curriculum, the curriculum and assessment specialist developed a process called "sketching the standards." The process was pilot tested with representatives from the project sites during four workshops held from February to April 1997. The process was later revised based on feedback during the pilot and subsequent work with some sites after the workshop. The complete process is

described in a publication available from the software developer[5]. The major steps are as follows:

1. Determine the course in which the standard's final assessment and rating will take place.

2. Identify and sketch the "pattern" of the standard. A pattern displays the standard graphically; this assists staff and teachers in translating the standard into a format that is useful for curriculum development. There are three possible patterns in a standard. The first, a big project, is used for standards that describe a multi-step, sequential process. The second, a content guide, is used for standards that consist of lists of topics or ideas that should be taught and assessed. The last, a template, is used for a standard that requires a student to carry out a sequence of steps repeatedly, using a different topic each time.

3. Create a sketch for the course in which the standard will be taught and assessed, the course into which the standard was placed in the first step. The sketch includes the following: 1) the pattern(s) and requirements of the standard; 2) assessments to rate students on the standard; 3) content from district curriculum guidelines; and 4) instructional decisions made by individual teachers. By sketching out the requirements of the standard, teachers can see where there are gaps, and where they need to add content, instruction, or assessment from the district curriculum or their own preferences. A standard may be taught in a single unit in a course or in multiple units.

Developers begin the sketching process with the course in which the standard will be assessed and assume that all the content and skills required for a given standard can be taught and assessed in this course. If they discover that this is not feasible, they identify course(s) earlier in the sequence that could include the necessary content and create additional sketches.

As workshop participants worked to create their graphics, the level of complexity in the standards became more apparent. Participants made the following comments after participating in the workshops:

> It's more than placing the standards; it's tearing them apart.
>
> We've never had any way to break down the standards. What does it mean day to day?
>
> The ultimate goal of the sketching is to have a scope and sequence of content . . . people are really exited about this.

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McGinnis, I. (1997). Sketching the Standards: A Strategy for Planning Standards-Referenced Curriculum. (2nd ed.). Minneapolis, MN; Norris Education Innovations, Inc.

After the workshop, members of the leadership from three sites met several times to continue drawing patterns for the standards. By the end of the project they had completed a pattern for every standard at each of the four levels: primary, intermediate, middle, and graduation.

Not all sites participated in developing the sketching process and the sites that assisted in the development varied in their use of the process after the training. The differences are as follows:

> Four sites participated fully and their administrators have continued to sketch standards after the training was completed. Teachers at one site later used the patterns to develop a scope and sequence for the following areas: people and cultures, scientific applications, and math applications for grade K-6; and resource management for grades K-12[6].
>
> One site said the process seemed like it would fit well with their needs, but they had not done any sketching yet.
>
> One site began the process but dropped out because the language and framework being used were inconsistent with their site's commitment to curriculum and instruction that is multicultural.

One site already had its own process for doing this and did not participate after the first session. One member described the decision not to participate further as follows, "What I saw resulting is the standards being used to drive the total district curriculum. Rather than the process that we're using -- I have a district curriculum, I want to know where the standards fit. So for me it's a matter of fitting, for other people it's a matter of generating curriculum and using the standards as the basis for that."

The process may, at least in part, address a common barrier to real reform as described by Darling-Hammond (1993):

> A massive geological dig would be required to unearth the tangled influences that created the many layers of policy that people in schools must now contend with. These influences make the serious implementation of new policies difficult, even impossible, without excavation and reform of what has gone before (p. 756).

The sketching process asks teachers to put everything on the table that they need to consider in developing instruction: the state standards; district and national standards, in some cases; district curricula; the teachers' own preferences for instruction; student needs; and available resources. In developing sketches of the standards, teachers are able to integrate these sometimes disparate pieces and identify gaps, areas of overlap, and instructional priorities. In some cases, creating sketches of the standards may be the first time a teacher has considered all of these instructional influences simultaneously. Sketching also forces communication across grade levels and classrooms within grade levels because teachers

[6] The standards only go through grade 9 but the district scope and sequence goes through grade 12 to include knowledge and skills that the district thinks is necessary in this area.

recognize the need to coordinate their instruction in order to adequately prepare students to achieve the high standards.

## Increase Teacher Capacity to Implement Standards

After the project ended, teachers who completed the survey were asked about changes in their knowledge and beliefs related to standards-based education. These areas were measured by six items on the survey (see Table 3). The greatest change occurred on the item "I have sufficient understanding of how to develop learning activities linked to the standards." The average rating on this item increased by 1.2 rating points. The next largest change was on a similar item, "I feel confident about my ability to link learning activities to the standards." The average rating on this item increased by 1.1 rating points.

All but one of the items showed a statistically significant increase as measured by a matched-pair's t-test. The only item not showing a significant change asked teachers about their belief that the standards were a fad. The lack of change in this item could be attributed to selection bias in the teachers who volunteered for the project. Those who believe the standards are a fad would be unlikely to take time to implement the standards.

Table 3: Change in Knowledge and Beliefs Related to Standards

Rating was on a scale of 1 to 5 where 1 was strongly disagree and 5 was strongly agree

| Item and (n) | Mean/Mode Rating Before Project | Mean Rating After Project | Mean Change |
|---|---|---|---|
| I have sufficient understanding of how to develop learning activities linked to the standards. (n=88) | 2.6<br>3.0 | 3.8<br>4.0 | 1.2* |
| I have sufficient understanding of how the standards fit with our district's K-12 curriculum. (n=89) | 2.7<br>3.0 | 3.7<br>4.0 | 1.0* |
| I think the standards are just another passing educational fad. (item scale reversed, n=85) | 3.5 | 3.3? | -.2 |
| I am confident about my ability to link learning activities to the standards. (n=89) | 2.9<br>3.0 | 4.1<br>4.0 | 1.1* |
| I believe that using standards can make a positive difference in student achievement. (n=89) | 3.2<br>3.0 | 3.8<br>4.0 | .6* |
| I believe that using standards can make a positive difference in my teaching. (n=89) | 3.2<br>3.0 | 3.9<br>4.0 | .7* |

*p<.0001

Another indicator of whether the project increased teacher capacity to develop standards-based instruction is the number of learning activities teachers completed during the project. The number of completed activities reported by teachers on the survey ranged from none to eighteen. Most often (28% of the respondents), a teacher reported completing three activities. Only 20% wrote more than four activities. If we expect teachers to change how they instruct and assess as a result of this project, it seems that teachers would have to have written more activities and had the opportunity to use them in the classroom before the project ended.

Based on these results, it appears that teacher knowledge and beliefs related to the standards changed in a positive direction during the study. Because there is no comparison group and many sites had other standards-related initiatives occurring during the IAS project, the results can not be used to conclude that the project alone or in combination produced these changes.

## Building a Network of Teachers Implementing Standards

An important aspect of this project was to establish a network of teachers who were working together to develop and use standards-based learning activities. As described earlier, the project undertook several activities to facilitate collaboration among participating teachers: creating a common template for writing and recording learning activities, providing an electronic database of these activities, and giving teachers Internet access and e-mail. In this section, we look at the extent to which a network developed during the project.

The survey asked teachers several questions about their level of collaboration with colleagues on the project. As shown in Table 4, almost half of the teachers reported that they always worked alone (19%) or primarily worked alone (28%). Only 8% of the teachers always worked with others.

Of the teachers who reported working with others at least some of the time, half spent less than four hours collaborating with colleagues to develop learning activities. The other half spent anywhere from five to 200 hours collaborating and the most typical length of time reported was nine hours.

When they collaborated, teachers were most likely to work with other teachers in their building who teach at the same grade level (41%) or in the same content area (36%). This disparity may be due to a greater number of elementary teachers returning the survey. If they collaborated with teachers outside their building, teachers were more likely to collaborate with others in the same content area (13%) than the same grade level (6%). The primary mode of communicating with colleagues on activities was in-person meetings. No one used faxes and only 3% used e-mail[7].

[7] The option of communicating by accessing someone else's activities in the database of activities was not included in the survey because we knew that school's could not access the electronic library during the project.

Table 4: Level of Collaboration with Colleagues

| *Which statement best describes your level of collaboration with colleagues when developing learning activities? (N=91)* | n | % |
|---|---|---|
| I always worked alone. | 17 | 19% |
| I worked primarily alone. | 25 | 28% |
| I sometimes worked alone and sometimes worked with other teachers. | 27 | 30% |
| I worked primarily with other teachers. | 13 | 14% |
| I always worked with other teachers. | 7 | 8% |
| Did not answer | 2 | 2% |

To assess whether the common template for writing and recording learning activities and the electronic potential for collaborating may have increased the amount teachers worked with others, we asked teachers how their level of collaboration with project colleagues compared to how they would usually plan classroom instruction. Of those who worked with others at least some during the project, 40% said their level of collaboration to write activities was very similar to how they would usually plan instruction. Only 27% said it was not similar or not very similar. This suggests that the common format may have encouraged this 27% to collaborate more than usual.

The survey also measured collaborative activity by asking teachers about getting input from others as they developed activities. As shown in Table 5, teachers were more likely to discuss suggestions for teaching techniques or student activities as they collaborated than they were to get input from colleagues about a learning activity. The average response to the former item was 4.0 on a scale where 1=rarely and 5=always. The average rating for the item about learning activities was lower at 3.1.

Table 5: Frequency of Input from Colleagues

Measured on a scale from 1-5 where 1 = rarely and 5 = always

| *When you worked with colleagues to write learning activities, how often were the following topics part of your conversation? (N=69)* | Most frequent | Mean |
|---|---|---|
| Input from colleagues about learning activities I was writing. | 4.0 | 3.1 |
| Useful suggestions for teaching techniques or student activities. | 4.0 | 4.0 |

Another method the project proposed to encourage collaborative activity among teachers was to establish an electronic library of learning activities linked to the standards. Teachers could collaborate through the library either by submitting activities they had developed or by

downloading an activity developed by someone else. This portion of the project could not be assessed, however, for several reasons. First, as mentioned earlier, due to technical problems none of the sites could access the electronic library located on a Website created by the software developer. Second, because it took longer to develop learning activities than originally intended, neither the local library nor the software vendor's library had much content during the project.

Given that it was not possible to ask teachers about their actual use of the library, we included the following items on the survey: 1) How comfortable are you with publishing learning activities you have written on your local UnitMaker system?, and 2) How comfortable are you with making your learning activities available for broad public dissemination through UnitHouse, the electronic curriculum library maintained by NEI?[8]

Half of the teachers said they would be very or somewhat comfortable publishing learning activities they had written in their local library. Just over one-third (34%) said they would be very uncomfortable doing this. Comfort with making their activities available broadly was similar. Fifty-two percent said they would be very or somewhat comfortable making their learning activities available for broad public dissemination through UnitHouse, the electronic curriculum library maintained by the software vendor. Thirty percent said they would be very uncomfortable doing this.

In attempt to measure Newmann, King, and Rigdon's (1997) shared commitment component of organizational capacity, the survey asked teachers how much working with colleagues to develop learning activities helped establish agreement on the topics listed in Table 6. The topic for which teachers most often reported that they established agreement when working together is "what students should learn in school." Forty-two percent reported that working with colleagues helped a lot to establish agreement in this area. In contrast, only 10% of the teachers said that working together helped a lot to establish agreement on "how hard students should work."

Given the short amount of time that many teachers spent working together, it is difficult to know if, given more discussion, more of them would have reported that the process helped create a shared commitment. It is encouraging, however, that so many reported that the process helped a lot in establishing agreement about what students should learn. This suggests that the process used in the project to create learning activities was effective in establishing consensus on what the standard says students need to know and be able to do.

[8] This reference is to the library created by the software developer as a Website.

Table 6: Extent that Collaborative Work Established Shared Commitment

| *How much did working with colleagues help establish agreement among your group on the issues below?* | Not at All | Little | Some | A Lot |
|---|---|---|---|---|
| How hard students should work. (n=70) | 11% | 29% | 50% | 10% |
| What students should learn in school. (n=69) | 0% | 17% | 41% | 42% |
| The beliefs and values about what the central mission of our school should be. (n=69) | 10% | 33% | 42% | 15% |
| The goals and priorities for our school. (n=69) | 10% | 28% | 39% | 23% |

## Increase the Level of Standards-Based Instruction and Assessment

Perhaps even more important to the success of standards-based reform is whether teachers change their classroom practice to include greater use of standards. This outcome was measured by several items on the written survey and questions from the interview. The results will be discussed in two sub-sections: developing instruction, and the effect on instruction and assessment practices.

### Developing Instruction

The survey asked teachers to describe their agreement with items describing standards-based practices as reflective of their practice before the project and currently. A higher number on the current rating indicates that the teacher's practice is more in agreement with the statement. Three items related to teacher's practices in developing instruction. The difference for each teacher's two ratings was calculated to assess the degree of change. Each of the three items showed a statistically significant positive change on a matched pairs t-test (see Table 7). The item that showed the largest magnitude of positive change was as follows: "I use the standards as the basis for planning learning activities".

Table 7: Change in Use of Standards for Developing Instruction

Rating was on a scale of 1 to 5 where 1 was strongly disagree and 5 was strongly agree

| Item and (n) | Mean/Mode Rating Before Project | Mean Rating After Project | Mean Change |
|---|---|---|---|
| I use the standards as a basis for planning learning activities. (n=88) | 2.3<br>2.0 | 3.7<br>4.0 | 1.4* |
| When planning or selecting learning activities, I focus on what and how well students are learning rather than on how engaged students are in an activity. (n=86) | 3.0<br>3.0 | 3.7<br>4.0 | .7* |

*p<.0001

The interview contained questions related to changes in how often teachers used standards-based practices in the classroom. A downside of our selection criteria for the interview sample was that we often got teachers who had been involved in standards before the project. This made it difficult to identify project effects from the effects of other standards-related interventions. We were surprised to learn that they defined the IAS project as using the software only and not also focusing on writing activities linked to the standards. From the teacher perspective, however, if they were already involved in standards implementation, the software was the most distinct characteristic of the IAS project. We needed to probe to get clarification about whether, aside from using the software, or not the process to develop learning activities in the project was different than how they would usually plan instruction. Once this was clarified, we learned the following:

- Of the twenty teachers interviewed, three fourths said the process for developing learning activities in the project was a lot or somewhat different that what they would usually do. The majority (11 people) described the difference as thinking of standards first and making a link between standards and activities. Three people said the process was different because they were writing down activities and provide more detail.

- One fourth of the teachers said the process was not at all different. All of these teachers had prior involvement with the standards.

A majority of the teachers who were interviewed (15) said they were very or somewhat likely to continue using the process developed in the project to create learning activities. The five teachers who answered "very unlikely" said that the software was the barrier. Answers to the above questions are hard to interpret because some schools wrote activities without software and some only with software so they had different frames of reference for the term "process." To the five who answered very unlikely because the software was a barrier, they considered the process using the software, not thinking about results first.

Effect on Instruction and Assessment Practices

In addition to measuring change in the process teachers use to develop activities, hopefully to looking at the standards first, the survey also asked teachers to describe their agreement with items describing standards-based practices as reflective of their practice before the project and currently (see Table 8). A higher number on the current rating indicates that the teacher's practice is more in agreement with the statement. The difference for each teacher's two ratings was calculated to assess the degree of change. Both items showed significant positive change as follows:

- I use the standards to explain expectations to students. (average increase of 1.3 points on a five-point scale).
- I link assessments to standards. (average increase of 1.3 points on a five-point scale).

Each of these changes was statistically significant on a matched pair's t-test.

Table 8: Change in Use of Standards for Instruction and Assessment

Rating was on a scale of 1 to 5 where 1 was strongly disagree and 5 was strongly agree

| Item and (n) | Mean/Mode Rating Before Project | Mean Rating After Project | Mean Change |
|---|---|---|---|
| I use the standards to explain expectations to students. (n=88) | 2.2<br>1.0 | 3.5<br>4.0 | 1.3* |
| I link assessments to standards. (n=86) | 2.5<br>2.0 | 3.8<br>4.0 | 1.3* |

*p<.0001

To supplement the information gathered through the survey, the interview asked about whether the project changed how teachers instruct and assess students. A majority (11) of the teachers who were interviewed said the project made little or no change in how they instructed. In most cases, they said this was because they had already been instructing consistent with the standards or because they had been involved in other standards implementation efforts and it was difficult to sort out the impact of each project on their instruction.

Seven teachers said the project changed how they instruct some or a lot. Three said that now they know where they want their students to go for every lesson. One talked about changes in grading practices – now he could set expectations for the minimum amount of work a student needed to do to receive credit - , another talked about seeing more student-

directed learning, another about more project-based learning. In addition, one of the teachers described why she thought the project made standards more accepted by teachers:

> "First came the standards and they were theoretical. Then, at our school, IAS focused on developmental activities; activities students would do to prepare for the standards. I think finally teachers saw how what they do in the classroom fits. Instead of big [assessment] packages they were working with learning activities and this made them more comfortable. There was less change required."

Two teachers did not rate the level of change.

Based on the interviews, the project was more likely to effect how teachers assess their students. A majority (11) of teachers said their involvement in IAS changed how they assess students a lot or some. Five said they were using performance packages and thus their assessments were more authentic. Three mentioned the use of checklists to show students what is expected for a passing grade. Two mentioned that they now involved students more in assessing their work; students may help develop rubrics to assess performance or give input into how they think they are doing on an assessment.

Of the 9 teachers who said the project had little or no affect on how they assess students, five said they were already using a lot of performance assessment and another said the change was due to the graduation standards not the project.

## Summary and Conclusions

The focus of this study was a project (IAS) designed to develop and pilot-test a process for implementing Minnesota's high standards for student learning. The state department of education (MDE) has mandated basic standards and high standards for Minnesota students. Current state rules require students to achieve passing scores on state-developed basic skill tests in reading, mathematics, and writing in order to graduate from high school.

The assessment of the high standards, however, provides school districts with much more flexibility. Because state law forbids a mandated state curriculum, each district must define its own instructional plans, and districts can also modify the state-developed assessment packages to fit their local context. Therefore, IAS leaders believed the next step in implementing the standards was to have teachers develop learning activities that could be used to prepare students for the assessments. In addition to developing a process for teachers to use in creating standards-based learning activities, the project also attempted to establish a network of teachers who were implementing the standards and to create an electronic library of learning activities linked to the standards.

We were hired by IAS to document their development of a process for integrating Minnesota's high standards for student learning into classroom instruction, to assess the

effectiveness of this process, and to identify effective practices for building teacher capacity to implement standards. Our study attempted to answer the following questions:

> What process did IAS develop for integrating Minnesota's high standards into classroom instruction? What did IAS learn about effective practice for integrating high standards into instruction?
>
> To what extent does the process IAS developed increase teacher capacity to implement Minnesota's high standards for student learning?
>
> To what extent did IAS develop a network of teachers who are working to implement Minnesota's high standards for student learning?
>
> To what extent did IAS increase the level of standards-based practice among teachers who participated in the project?

In this section we summarize the results of our study and discuss the implications for further efforts to implement standards-based reforms. We also discuss areas where further research is needed to increase our understanding of the change theory behind standards-based reform and to increase the chance that it will ultimately improve student achievement.

## A Process for Developing Standards-Based Instruction

Perhaps the most significant contributions of this project to our understanding of how to implement standards-based reform were the identification of a district-level role for implementation, and the creation of a process for developing a standards-based curriculum. This is consistent with the finding of Massell, Kirst, and Hoppe (1997) that policymakers have overlooked an important role for districts in carrying out standards-based reform. This project identified a role for the district and a process, sketching the standards, for creating an integrated, district-wide plan for providing standards-based instruction and assessment.

The project also recognized the importance of helping teachers recognize the difference between learning activities and performance tasks. Working with a specialist in curriculum and assessment, the LT decided that the purpose of learning activities is to provide students with instruction and practice on skills they will need to demonstrate later on a performance task. Therefore, the checklist, or list of what a quality performance is, in a learning activity should not be graded but only used to communicate expectations to students and for student self-evaluation.

## Increase Teacher Capacity to Implement Standards

Teacher's self-reports on the survey indicated positive changes in their knowledge and beliefs related to the standards. The changes were statistically significant on all but one item. This suggests that the process IAS developed for teachers to write standards-based instructional activities was effective in increasing their understanding of how to use

standards in instruction, and in making their attitudes toward standards more positive. However, given the low response rate to the survey we are hesitant to generalize these results to all teachers.

Teachers' knowledge and skills are one part of Newmann, King, and Rigdon's (1997) organizational capacity. They believe external accountability systems, such as the Minnesota standards, will not be effective in improving student learning unless schools develop their organizational capacity. The results of this study suggest that by developing standards-based instructional activities for their own students teachers can increase their skills and knowledge related to implementing standards-based education.

The relationship between participation in IAS and the observed changes in teacher's knowledge and beliefs can not be determined definitively from this study. Many of the teachers in this study were involved in other standards-related initiatives simultaneously with their participation in IAS, making it difficult to attribute any changes specifically to IAS activities. Further research is needed using a design that incorporates a comparison group in order to better assess the specific effects of the IAS process on teacher knowledge and beliefs.

Further development of tools to measure changes in teacher knowledge and skills related to the standards is also needed. Part of the difficulty in designing such tools is the lack of a consistent definition of what skills and knowledge teachers need to implement standards. In a specific context, however, researchers could assess the level of teacher skill by rating the quality of the activities they develop, assuming that the teachers and administrators in that context could agree on measurable indicators of quality.

## Build a Network of Teachers Implementing Standards

A key part of the project's theory of change was that teachers would work together to develop instructional activities and build a network of teachers that could support each other in using these activities in the classroom and assessing students.

For most of the teachers in the project, the strategies IAS used to encourage collaboration were not effective. Only 8% of the teachers in the project always worked with others to write activities. Almost half (47%) reported that they always worked alone or primarily worked alone.

Of the teachers who reported working with others at least some of the time, half spent less than four hours collaborating with colleagues to develop learning activities. The other half spent anywhere from five to 200 hours collaborating, and the most typical total amount of time they reported collaborating during the project was nine hours. Only 3% of the teachers used e-mail to collaborate; the primary vehicle for communication was in-person meetings.

One explanation for the low level of collaboration may be the lack of time. Many of the teachers interviewed said that it was difficult to find time to meet with colleagues during the school year. Hence, they either developed activities completely on their own or only sought feedback from colleagues once the activity was fully developed. Further efforts at standards-

implementation should allocate more funding for curriculum development time so teachers can, perhaps, find more time to collaborate.

The study provides preliminary evidence that working together to develop standards-based instruction may help teachers develop a shared commitment, another component of Newmann, King, and Rigdon's (1997) organizational capacity. Teachers who worked with others at least some of the time were most likely to establish on agreement in the area of what students should learn in school. This agreement can enhance student learning because, as students progress through the school system, they are more likely to encounter teachers that have a shared vision of what students should be learning.

Due to complications at several points in the project's implementation plan, this study does not provide an adequate test of how effective of the project's strategies to encourage collaboration (common activity template, e-mail, electronic libraries of activities) may be. For example, the inability of teachers to access the electronic library during the project meant that we could not assess how often teachers used the library or whether they found it helpful in developing their own instruction. Most sites were not able to provide teachers with reliable access to e-mail during much of the project, a factor that likely reduced teacher use of this method for communicating with other developers.

## Increase the Level of Standards-Based Instruction and Assessment

Items on the survey related to teacher use of standards in developing instruction, providing instruction, and assessing students showed that teachers noted a significant increase in their level of use during the project. The item that showed the largest magnitude of positive change was "I use the standards as the basis for planning learning activities." Another change was that teachers increased their use of the standards to explain expectations to students.

In the sample of teachers who were interviewed, three-fourths said the process for developing learning activities in IAS was different than what they would usually do. The majority described the difference as thinking of standards first and making a link between standards and activities.

As with the reported changes in teacher knowledge and beliefs about the standards, the relationship between IAS and changes in teacher's use of standards-related practices can not be determined from this study. While they were involved in IAS many teachers were involved in other projects related to standards, some of more intensity than IAS.

Further development of tools to measure standards-related practices is needed. In addition to teacher self-report it would be important to incorporate observations by an external researcher to avoid the potential of self-report bias. Further research is needed in a situation where a comparison group is available so we could better isolate the effects of IAS's process for implementing standards from other district initiatives.

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